Understanding Interface Numbering and Cisco IOS Software Basics

This chapter provides an overview of the interface numbering in the Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers. It also describes how to use the Cisco IOS software commands.

Understanding Interface Numbering

This section contains information with which you should be familiar before you begin to configure your router for the first time, including interface numbering and what you should do before starting your router.

Cisco 2600 Series Interface Numbering

Each network interface on a Cisco 2600 series router is identified by a slot number and a unit number. Table 1-1 lists the router models and summarizes the interfaces supported on each model that are available in the Cisco 2600 series routers.

Table 1-1 Summary of Cisco 2600 Series Router Models and Interfaces

Model	Ethernet (10BASE-T)	Token-Ring (RJ-45)	Fast Ethernet (10/100)	Network Module Slot	WAN Interface Card Slots	Advanced Integration Module Slots
Cisco 2610	1			1	2	1
Cisco 2610XM			1	1	2	1
Cisco 2611	2			1	2	1
Cisco 2611XM			2	1	2	1
Cisco 2612	1	1		1	2	1
Cisco 2613		1		1	2	1
Cisco 2620			1	1	2	1
Cisco 2620XM			1	1	2	1
Cisco 2621			2	1	2	1
Cisco 2621XM			2	1	2	1
Cisco 2650			1	1	2	1

Table 1-1 Summary of Cisco 2600 Series Router Models and Interfaces (continued)

Model	Ethernet (10BASE-T)	Token-Ring (RJ-45)	Fast Ethernet (10/100)	Network Module Slot	WAN Interface Card Slots	Advanced Integration Module Slots
Cisco 2650XM			1	1	2	1
Cisco 2651			2	1	2	1
Cisco 2651XM			2	1	2	1
Cisco 2691			2	1	3	2

Note The number and type of interfaces vary depending on the router.

WAN and LAN Interface Numbering

The Cisco 2600 series router chassis contains the following wide-area network (WAN) and local-area network (LAN) interface types:

- Built-in LAN interfaces: Ethernet, FastEthernet, Token Ring
- Two or three slots in which you can install WAN interface cards (WICs)
- One slot in which you can install a network module

The numbering format is *Interface-type Slot-number*/*Interface-number*. Two examples are:

```
Ethernet 0/0
Serial 1/2
```

The slot number is 0 for all built-in interfaces and 0 for all WIC interfaces; the slot number is 1 for network module interfaces.

Interface (port) numbers begin at 0 for each interface type, and continue from right to left and (if necessary) from bottom to top.

Figure 1-1 below shows a router of 1 RU height with:

- A WIC in each WIC slot (containing interface Serial 0/0 in physical slot W0, and interface Serial 0/1 in physical slot W1)
- A 4-serial-port network module in slot 1 (containing the following ports: Serial 1/0, Serial 1/1, Serial 1/2, and Serial 1/3)
- First built-in Ethernet interface—Ethernet 0/0
- Second built-in Ethernet interface—Ethernet 0/1, or optionally in Cisco 2612 and Cisco 2613 only: Token Ring interface 0/0

Figure 1-1 Example of 1RU Router

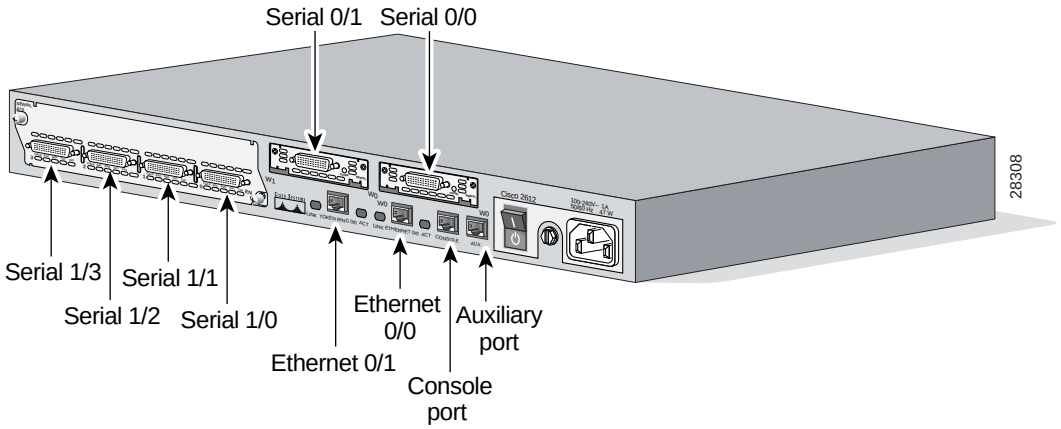
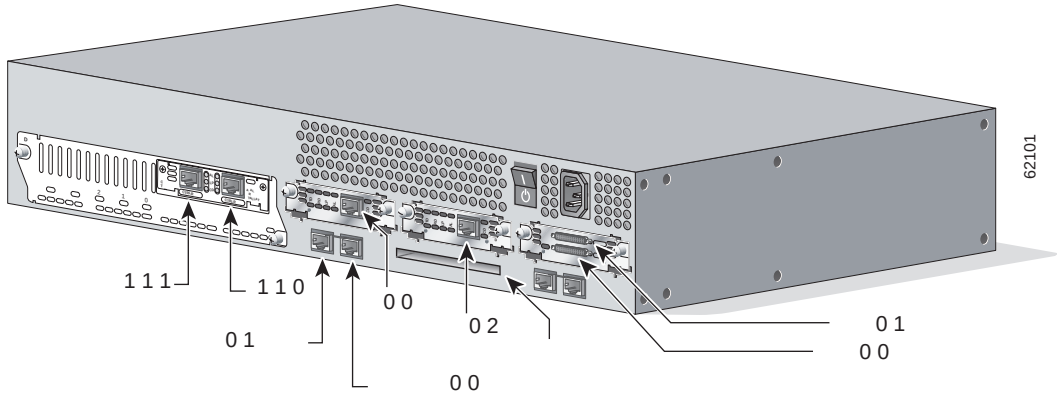


Figure 1-2 below shows a router of 2 RU height with:

- A WIC in each WIC slot (containing interfaces Serial 0/0 and Serial 0/1 in physical slot W0, interface Serial 0/2 in physical slot W1, and interface BRI 0/0 in physical slot W2)
- A 2-port T1 network module in slot 1 (containing the following ports: T1 1/0 and T1 1/1)
- Two built-in Ethernet 10/100 interfaces—FastEthernet 0/0 and FastEthernet 0/1

Figure 1-2 Example of a 2RU Router



Note The slot number for all WIC interfaces is always 0. (The W0 and W1 slot designations are for physical slot identification only.) Interfaces in the WICs are numbered from right to left, starting with 0/0 for each interface type, regardless of which physical slot the WICs are installed in. Some examples are:

- If physical slot W0 is empty and physical slot W1 contains a 1-port serial WIC, the interface number in the WIC is numbered Serial 0/0.
- If slot W0 contains a 2-port serial WIC and slot W1 contains a 1-port serial WIC, the interfaces in physical slot W0 are numbered Serial 0/0 and Serial 0/1, and the interface in physical slot W1 is numbered Serial 0/2.
- If slot W0 contains a 2-port serial WIC and slot W1 contains a 1-port BRI WIC, the interfaces in physical slot W0 are numbered Serial 0/0 and Serial 0/1, and the interface in physical slot W1 is numbered BRI 0/0.

Voice Interface Numbering in Cisco 2600 Series Routers

Voice interfaces are numbered differently from the WAN interfaces described in the previous section. Voice interfaces are numbered as follows:

chassis slot/voice module slot/voice interface

If a 4-channel voice network module is installed in chassis slot 1, the voice interfaces are:

- 1/0/0—Chassis slot 1/Voice module slot 0/Voice interface 0
- 1/0/1—Chassis slot 1/Voice module slot 0/Voice interface 1
- 1/1/0—Chassis slot 1/Voice module slot 1/Voice interface 0
- 1/1/1—Chassis slot 1/Voice module slot 1/Voice interface 1

Cisco 3600 Series Interface Numbering

Each individual network interface on a Cisco 3600 series router is identified by a slot number and a unit number.

Cisco 3600 Series Router Slot Numbering

A Cisco 3600 series router chassis includes up to six slots in which you can install modules. The Cisco 3600 series includes the Cisco 3660 (see Figure 1-3), Cisco 3640 (see Figure 1-4) and Cisco 3620 routers (see Figure 1-5). The Cisco 3660 has six network module slots, the Cisco 3640 has four slots, the Cisco 3620 has two slots, and the Cisco 3631 (see Figure 1-6) has four slots. You can install any module into any available slot in the chassis.

Figure 1-3 Cisco 3660 Router Rear View

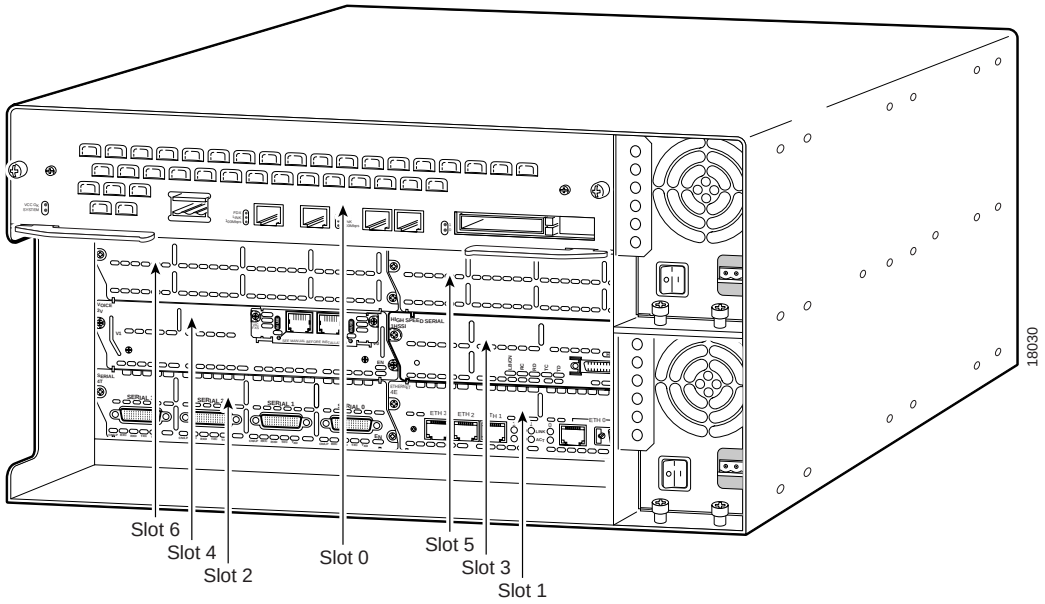


Figure 1-4 Cisco 3640 Router Rear View

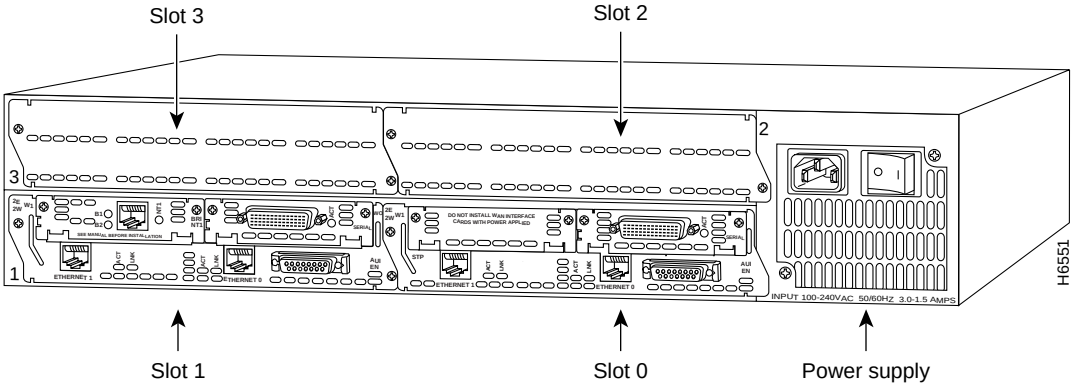


Figure 1-5 Cisco 3620 Router Rear View

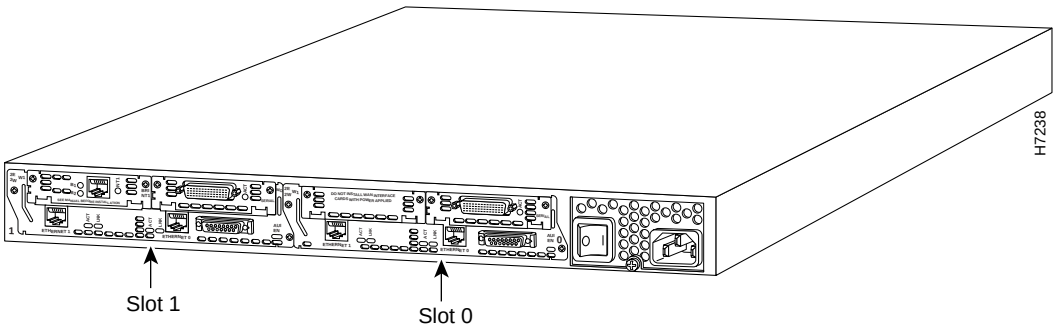
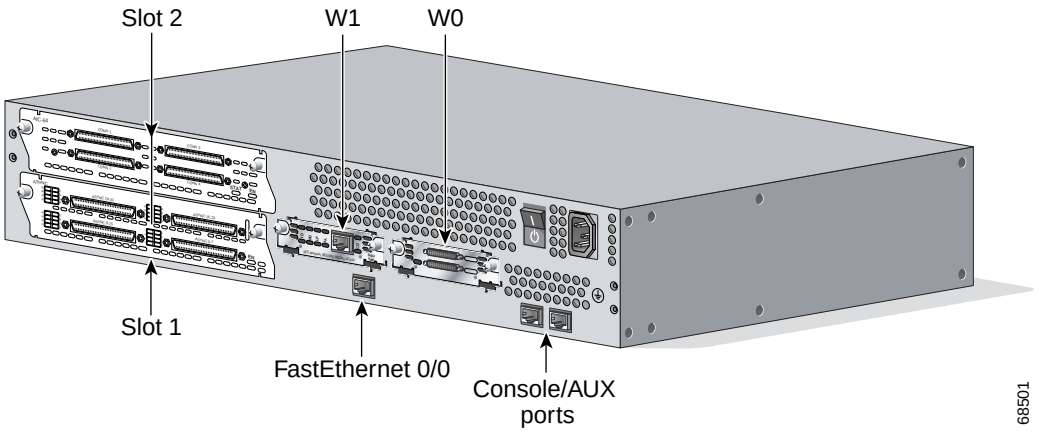


Figure 1-6 Cisco 3631 Router Rear View



For the Cisco 3660 router (see Figure 1-3), the slots are numbered as follows:

- Slot 0 contains fixed FastEthernet ports and is located at the top of the chassis.
- Slot 1 is at the bottom right (as viewed from the rear of the chassis), near the power supply.
- Slot 2 is at the bottom left.
- Slot 3 is at the right, above slot 1.
- Slot 4 is at the left, above slot 2
- Slot 5 is at the right, above slot 3.
- Slot 6 is at the left, above slot 4.

For the Cisco 3620 and Cisco 3640 routers shown in Figure 1-4 and Figure 1-5, the slots are numbered as follows:

- Slot 0 is at the bottom right (as viewed from the rear of the chassis), near the power supply.
- Slot 1 is at the bottom left.
- Slot 2 is at the top right, above slot 0.
- Slot 3 is at the top left, above slot 1.

For the Cisco 3631 router shown in Figure 1-6, the slots are numbered as follows:

- Slot 0 for all built-in interfaces like the FastEthernet port at the bottom center near the Console/AUX ports
- Slot 0 for all WAN interface card (WIC) interfaces
- Slot 1 for network module interfaces at the bottom left.
- Slot 2 for network module interfaces at the top left, above slot 1.

Figure 1-7 Example of the Cisco 3631 Router Interface Numbering

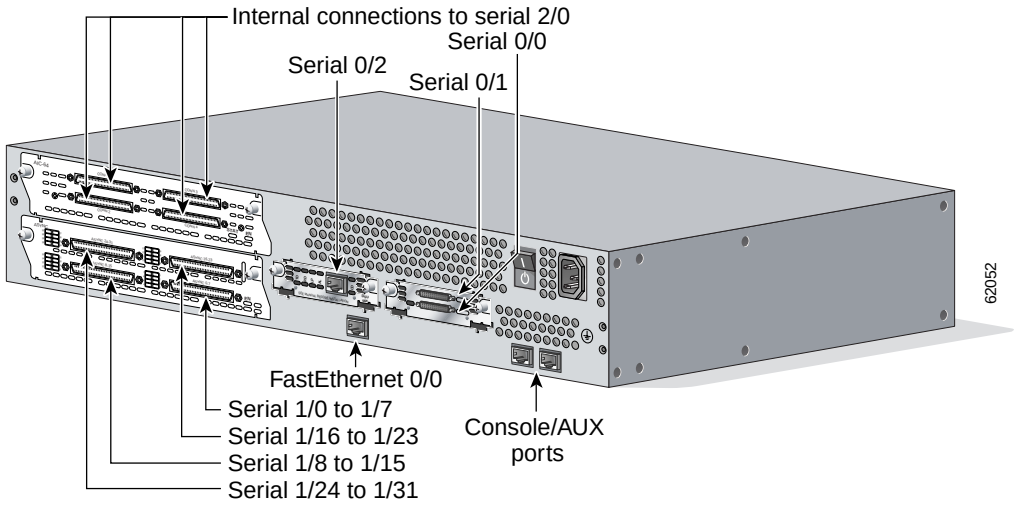


Figure 1-7 shows an example of the interface numbering where the following interfaces are installed:

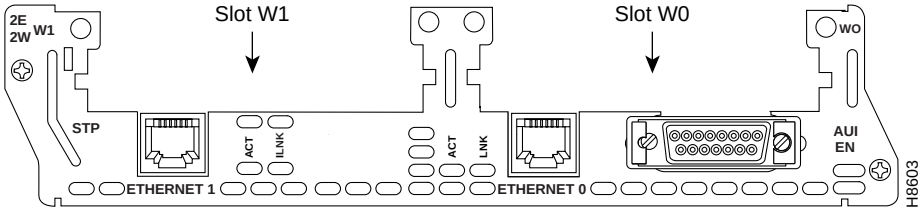
- A WIC in each WIC slot (containing interfaces serial 0/0 and serial 0/1 in physical slot W0, and interface serial 0/2 in physical slot W1)
- A 32-port asynchronous network module in slot 1 (containing interfaces serial 1/0 through serial 1/31)
- An alarm interface controller network module in slot 2 (internally connected to interface serial 2/0)
- One built-in Ethernet 10/100 interface—FastEthernet 0/0

Note The logical slot number for all WIC interfaces is always 0. (The W0 and W1 slot designations are for physical slot identification only.) Interfaces in the WICs are numbered from right to left, starting with 0/0 for each interface type, regardless of which physical slot the WICs are installed in. Some examples are:

  - If physical slot W0 is empty and physical slot W1 contains a 1-port serial WIC, then the logical interface in the WIC is numbered serial 0/0.
  - If physical slot W0 contains a 2-port serial WIC and slot W1 contains a 1-port serial WIC, then the logical interfaces in physical slot W0 are numbered serial 0/0 and serial 0/1 and the logical interface in physical slot W1 is numbered Serial 0/2.
  - If physical slot W0 contains a 2-port serial WIC and slot W1 contains a 1-port BRI WIC, then the logical interfaces in physical slot W0 are numbered serial 0/0 and serial 0/1, and the logical interface in physical slot W1 is numbered BRI 0/0.

Some modules have two small slots, labeled W0 and W1, for WAN interface cards. For example, Figure 1-8 shows the W0 and W1 slots of the 2 Ethernet 2 WAN card slot (2E 2-slot) module. You can install WAN interface cards into the small module slots (W0 and W1). Integrated Services Digital Network (ISDN) Basic Rate Interface (BRI) WAN interface cards are keyed so that you can install them into slot W1 only. Serial WAN interface cards can be installed into either slot, W0 or W1.

Figure 1-8 WAN Interface Card Slots



Cisco 3600 Series Router Unit Numbering

Cisco 3600 series routers unit numbers identify the interfaces on the modules and WAN interface cards installed in the router. Unit numbers begin at 0 for each interface type, and continue from right to left and (if necessary) from bottom to top. Modules and WAN interface cards are identified by interface type, slot number, followed by a forward slash
(/), and then the unit number; for example, Ethernet 0/0.

Note In the Cisco 3660 router, the fixed FastEthernet ports are located in chassis slot 0, and are identified by:
interface type chassis slot/ unit number
For example: FastEthernet 0/0

Figure 1-9 shows a router with a 2E 2-slot module in slots 0 and 1. Two serial WAN interface cards are installed in the module in slot 0. One serial and one ISDN BRI WAN interface card are installed in the module in slot 1.

As shown in Figure 1-9, the unit numbers are as follows:

- Slot 0, Ethernet interface 0, referred to as Ethernet 0/0
- Slot 0, Ethernet interface 1, referred to as Ethernet 0/1
- Slot 0, serial interface 0, referred to as serial 0/0
- Slot 0, serial interface 1, referred to as serial 0/1
- Slot 1, Ethernet interface 0, referred to as Ethernet 1/0
- Slot 1, Ethernet interface 1, referred to as Ethernet 1/1
- Slot 1, serial interface 0, referred to as serial 1/0
- Slot 1, BRI interface 0, referred to as BRI 1/0

Note The 2E 2-slot module described in this example provides both an attachment unit interface (AUI) and 10BASE-T port. Only one of these ports can be used at a time. The module automatically detects which port, AUI or 10BASE-T, is in use.

Cisco 3600 Series Routers Voice Interface Numbering

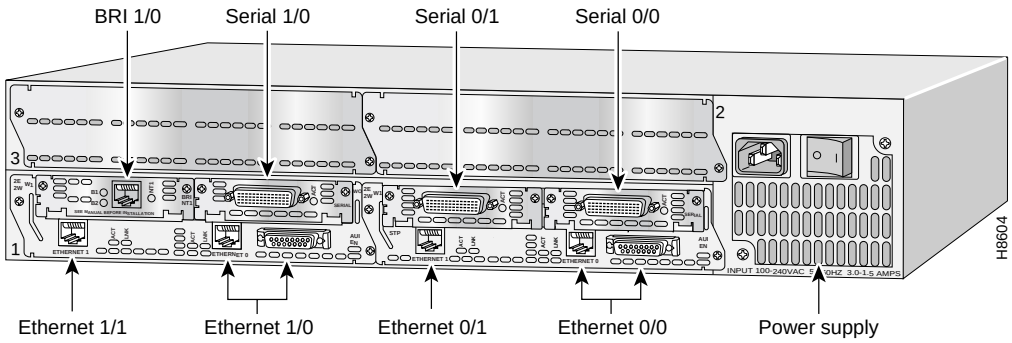
Voice interfaces are numbered differently from WAN interfaces described in the previous section, "Cisco 3600 Series Router Unit Numbering." Voice interfaces are numbered as follows:

interface type chassis slot/voice module slot/voice interface

If you have a 4-channel voice network module installed in slot 1 of your router, the voice interfaces will be:

- Slot 1, voice network module slot 0, voice interface 0, referred to as voice 1/0/0 (closest to chassis slot 0)
- Slot 1, voice network module slot 0, voice interface 1, referred to as voice 1/0/1
- Slot 1, voice network module slot 1, voice interface 0, referred to as voice 1/1/0
- Slot 1, voice network module slot 1, voice interface 1, referred to as voice 1/1/1 (farthest from chassis slot 0)

Figure 1-9 Cisco 3600 Series Unit Numbers



Cisco 3700 Series Interface Numbering

Each WAN and LAN interface on a Cisco 3700 series router is identified by a slot number and a unit number. The Cisco 3700 series includes the Cisco 3725 and Cisco 3745.

Cisco 3725 Router Interface Numbering

The Cisco 3725 router chassis contains the following wide-area network (WAN) and local area network (LAN) interface types:

- Two built-in FastEthernet LAN interfaces
- Three slots in which you can install WAN interface cards (WICs)
- One single-width slot (slot 1) in which you can install one network module
- One double-width slot (slot 2) in which you can install one single-width or double-width network module

Cisco 3725 Router Slot Numbering

The numbering format is *Interface-type Slot-number*/*Interface-number*. Two examples are:

```
FastEthernet 0/0
Serial 1/2.
```

The slot numbers are as follows:

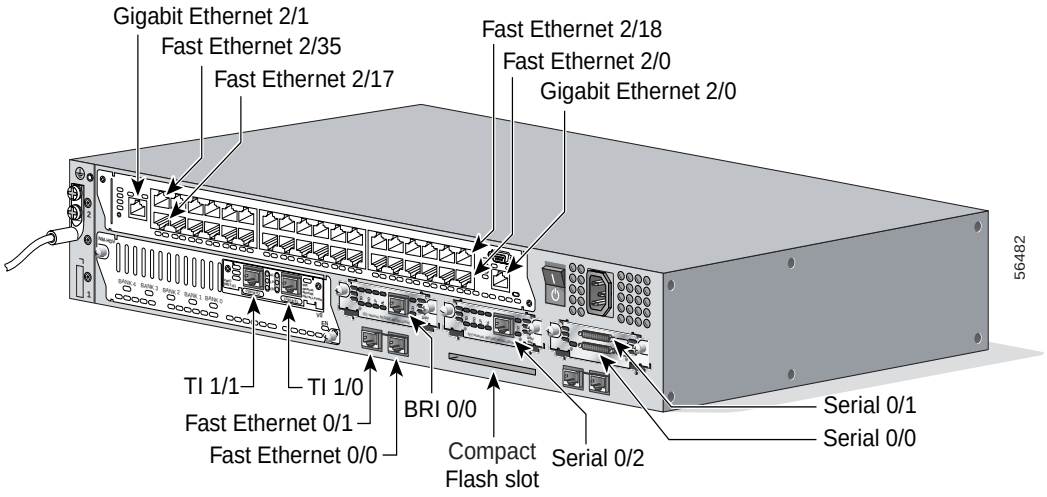
- 0 for all built-in interfaces
- 0 for all WIC interfaces
- 1 for interfaces in the single-width network module slot
- 2 for interfaces in the double-width network module slot

Interface (port) numbers begin at 0 for each interface type, and continue from right to left and (if necessary) from bottom to top.

Figure 1-10 below shows an example of interface numbering on a Cisco 3725 router with:

- A WIC in each WIC slot (containing interfaces Serial 0/0 and Serial 0/1 in physical slot W0, interface Serial 0/2 in physical slot W1, and interface BRI 0/0 in physical slot W2)
- A 2-port T1 network module in slot 1 (containing the following ports: T1 1/0 and T1 1/1)
- A 36-port Etherswitch network module in slot 2 (containing the following ports: FastEthernet 2/0 through 2/35, and GigabitEthernet 2/0 and 2/1)
- Two built-in Ethernet 10/100 interfaces—FastEthernet 0/0 and FastEthernet 0/1

Figure 1-10 Cisco 3725 Router Rear View



Note The slot number for all WIC interfaces is always 0. (The W0 and W1 slot designations are for physical slot identification only.) Interfaces in the WICs are numbered from right to left, starting with 0/0 for each interface type, regardless of which physical slot the WICs are installed in. Some examples are:

- If physical slot W0 is empty and physical slot W1 contains a 1-port serial WIC, the interface in the WIC is numbered Serial 0/0.
- If slot W0 contains a 2-port serial WIC and slot W1 contains a 1-port serial WIC, the interfaces in physical slot W0 are numbered Serial 0/0 and Serial 0/1, and the interface in physical slot W1 is numbered Serial 0/2.
- If slot W0 contains a 2-port serial WIC and slot W1 contains a 1-port BRI WIC, the interfaces in physical slot W0 are numbered Serial 0/0 and Serial 0/1, and the interface in physical slot W1 is numbered BRI 0/0.

Cisco 3745 Router Interface Numbering

The Cisco 3745 router chassis contains the following wide-area network (WAN) and local-area network (LAN) interface types:

- 2 built-in FastEthernet LAN interfaces
- 3 slots in which you can install WAN or voice interface cards
- 4 network module slots.

Cisco 3745 Router Slot Numbering

The numbering format in the Cisco 3745 router is *Interface type Slot number*/*Interface number.* Two examples are:

```
FastEthernet 0/0
Serial 1/2.
```

The slot numbers are as follows:

- 0 for all built-in interfaces
- 0 for all WIC interfaces
- 1 for the lower right network module slot
- 2 for the lower left network module slot
- 3 for the upper right network module slot
- 4 for the upper left network module slot

If double-wide network modules are installed, the slot numbers are as follows:

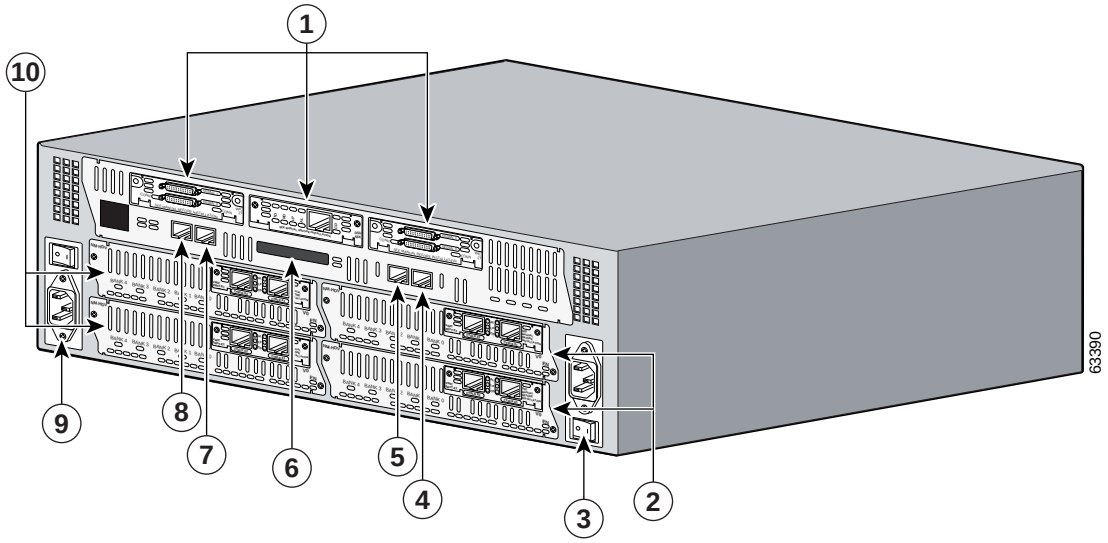
- 2 for the lower double-wide slot
- 4 for the upper double-wide slot

Interface (port) numbers begin at 0 for each interface type, and continue from right to left and (if necessary) from bottom to top.

Figure 1-11 shows the rear panel of the Cisco 3745 with:

- A WIC in each of the three WAN interface card slots
- A single-width network module in each of the four network module slots
- Two AC power supplies

Figure 1-11 Cisco 3745 Rear Panel



1	Console port	**5**	Compact Flash slot
2	Auxiliary port	**6**	Power supplies
3	FastEthernet 0/1	**7**	Network module slots
4	FastEthernet 0/0	**8**	WAN or voice interface card slots

Note The slot number for all WIC interfaces is always 0. (The W0, W1, and W2 slot designations are for physical slot identification only.) Interfaces in the WICs are numbered from right to left, starting with 0/0 for each interface type, regardless of which physical slot the WICs are installed in. Some examples are:

- If physical slot W0 is empty and physical slot W1 contains a 1-port serial WIC, the interface in the WIC is numbered Serial 0/0.
- If slot W0 contains a 2-port serial WIC and slot W1 contains a 1-port serial WIC, the interfaces in physical slot W0 are numbered Serial 0/0 and Serial 0/1, and the interface in physical slot W1 is numbered Serial 0/2.
- If slot W0 contains a 2-port serial WIC and slot W1 contains a 1-port BRI WIC, the interfaces in physical slot W0 are numbered Serial 0/0 and Serial 0/1, and the interface in physical slot W1 is numbered BRI 0/0.

Cisco 3700 Series Routers Voice Interface Numbering

Voice interfaces in Cisco 3725 and Cisco 3745 routers are numbered differently from the WAN interfaces described in the previous section Voice interfaces are numbered as follows:

chassis slot/voice module slot/voice interface

If a 4-channel voice network module is installed in chassis slot 1, the voice interfaces are:

- 1/0/0—Chassis slot 1/Voice module slot 0/Voice interface 0
- 1/0/1—Chassis slot 1/Voice module slot 0/Voice interface 1
- 1/1/0—Chassis slot 1/Voice module slot 1/Voice interface 0
- 1/1/1—Chassis slot 1/Voice module slot 1/Voice interface 1

Understanding Cisco IOS Software Basics

This section describes what you need to know about the Cisco IOS software before you configure the router using the command-line interface (CLI). This chapter includes the following:

- Getting Help, page 1-13
- Understanding Command Modes, page 1-14
- Undoing a Command or Feature, page 1-15
- Saving Configuration Changes, page 1-15
- Where to Go Next, page 1-15

Understanding these concepts will save time as you begin to use the CLI. If you have never used the Cisco IOS software or need a refresher, take a few minutes to read this chapter before you proceed to the next chapter.

If you are already familiar with Cisco IOS software, proceed to Chapter 2, "Using the Setup Command Facility."

Getting Help

Use the question mark (?) and arrow keys to help you enter commands:

- For a list of available commands, enter a question mark:

  ```
  Router> ?
  ```

- To complete a command, enter a few known characters followed by a question mark (with no space):

  ```
  Router> s?
  ```

- For a list of command variables, enter the command followed by a space and a question mark:

  ```
  Router> show ?
  ```

- To redisplay a command you previously entered, press the up arrow key. You can continue to press the up arrow key for more commands.

Understanding Command Modes

The Cisco IOS user interface is divided into different modes. Each command mode permits you to configure different components on your router. The commands available at any given time depend on which mode you are currently in. Entering a question mark (**?**) at the prompt displays a list of commands available for each command mode. Table 1-2 lists the most common command modes.

Table 1-2 Common Command Modes

Command Mode	Access Method	Router Prompt Displayed	Exit Method
User EXEC	Log in.	`Router>`	Use the **logout** command.
Privileged EXEC	From user EXEC mode, enter the **enable** command.	`Router#`	To exit to user EXEC mode, use the **disable**, **exit**, or **logout** command.
Global configuration	From the privileged EXEC mode, enter the **configure terminal** command.	`Router (config)#`	To exit to privileged EXEC mode, use the **exit** or **end** command, or press **Ctrl-z**.
Interface configuration	From the global configuration mode, enter the **interface** *type number* command, such as **interface serial 0/0**.	`Router (config-if)#`	To exit to global configuration mode, use the **exit** command. To exit directly to privileged EXEC mode, press **Ctrl-z**.

Timesaver

Each command mode restricts you to a subset of commands. If you are having trouble entering a command, check the prompt, and enter the question mark (**?**) for a list of available commands. You might be in the wrong command mode or using the wrong syntax.

In the following example, notice how the prompt changes after each command to indicate a new command mode:

```
Router> enable
Password: <enable password>
Router# configure terminal
Router(config)# interface serial 0/0
Router(config-if)# line 0
Router(config-line)# controller t1 0
Router(config-controller)# exit
Router(config)# exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

The last message is normal and does not indicate an error. Press **Return** to get the `Router#` prompt.

Note You can press **Ctrl-z** in any mode to immediately return to enable mode (`Router#`), instead of entering **exit**, which returns you to the previous mode.

Undoing a Command or Feature

If you want to undo a command you entered or disable a feature, enter the keyword **no** before most commands; for example, **no ip routing**.

Saving Configuration Changes

You need to enter the **copy running-config startup-config** command to save your configuration changes to nonvolatile random-access memory (NVRAM), so the changes are not lost if there is a system reload or power outage. For example:

```
Router# copy running-config startup-config
Building configuration...
```

It might take a minute or two to save the configuration to NVRAM. After the configuration has been saved, the following appears:

```
[OK]
Router#
```

Upgrading to a New Cisco IOS Release

To install or upgrade to a new Cisco IOS release, refer to Appendix B, "Formatting the Compact Flash Memory Cards."

Where to Go Next

Now that you have learned some Cisco IOS software basics, you can begin to configure the router using the CLI.

Remember that:

- You can use the question mark (?) and arrow keys to help you enter commands.
- Each command mode restricts you to a set of commands. If you have difficulty entering a command, check the prompt and then enter the question mark (**?**) for a list of available commands. You might be in the wrong command mode or using the wrong syntax.
- To disable a feature, enter the keyword **no** before the command; for example, **no ip routing**.
- You need to save your configuration changes to NVRAM so the changes are not lost if there is a system reload or power outage.

Proceed to Chapter 2, "Using the Setup Command Facility," to begin configuring the router.